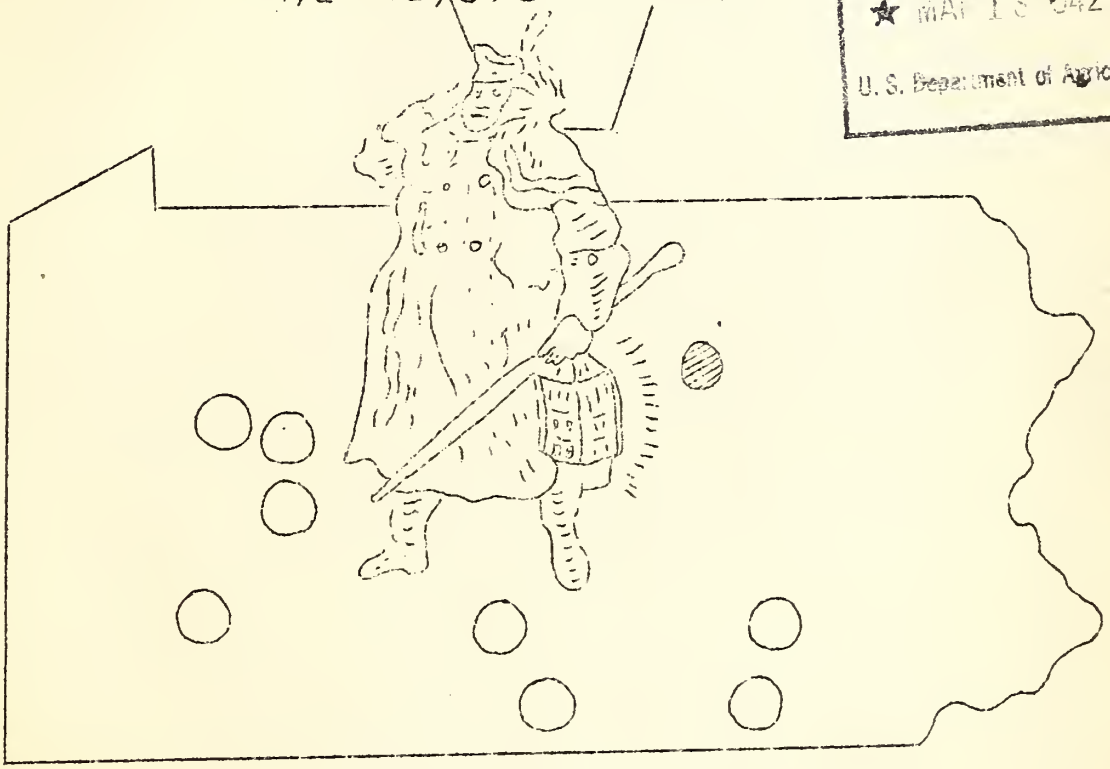
THE CRIER

SOIL CONSERVATION
IN
THE KEYSTONE STATE



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THE CRIER

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RESEARCH AND PROGRESS

It has been said, that if the entire history of man were to be condensed into the twelve hours shown on the face of a clock, only the last minute or two would represent the progress achieved by the modern world as we know it. Only in that last minute or so has there been any widespread use of research and experiment to further man's knowledge. Previously, advancement had been accomplished by the painfully slow process of experience and luckydiscovery ---- the hit-or-miss method.

Today, any organization, in order to live, must include research and experiment within its scheme of things. The form and substance of the research may vary but it must achieve progress.

Briefly, research and experiment in Soil Conservation means the development and improvement of erosion-control measures in the field. The subject sounds as if it might be accomplished simply, but soil erosion is far from being a simple subject. The only way to meet the problem of improving the means of controlling erosion rests in a broad comprehensive attack to be achieved by pooling the facilities and knowledge of all organizations which are in any way concerned with saving our topsoil.

That is a big order, but only through research can progress be made.

Did you know that—

An average acre of soil, one inch deep, weighs 167 tons?

An acre of land planted continuously to corn on an eight percent slope has been known to lose sixty-one tons of soil a year? (Missouri Experiment Station)

It would take more than 50 centuries to erode all the soil from a good meadow on an average slope and soil? Nature builds soil faster than that. (Ithaca Experiment Station)

Two adjoining fields in New York State, identical in size, shape, slope, and soil type, showed a loss for the one field, planted in potatoes, of 28,000 pounds of soil per acre (summer of 1935)? Its twin, the second field, planted to potatoes, oats, and clover in 100 foot strips, lost 43 pounds of soil per acre? (Ithaca Experiment Station)

An inch of rain on an acre of land is sufficient to fill a tank 125 feet high and six feet in diameter?

An inch of rain can fall in 20 minutes?

A meadow can soak up as much as 98% of the rain that falls on it? On the same soil and slope, fallow ground permits 20% of the rain to run off immediately? (Ithaca Experiment Station)

SECRETARY WALLACE SAYS -

In a recent talk entitled "Flood Control at the Grass Roots" given before the National Rivers and Harbors Congress in Washington, D.C., Henry A. Wallace, Secretary of Agriculture, remarked on the growing tendency to view soil and water conservation and the control of floods as one and the same thing. According to the Secretary, the rain and snow running off cultivated lands must be held back, and its flow must be controlled in any program to tame the force of floods. The Secretary cautions that control of runoff - erosion control - is not in itself a cure-all for floods. On the contrary, "Rearrangements of the face of the land" he says, "such as are required for civilized occupation and the pursuits of modern agriculture and industry, make inevitable an increased runoff of water and of sediment. It is a matter of record, I believe, that flood stages have been mounting in this country and that sedimentation has been increasing throughout our history".

Secretary Wallace believes that treatment of whole watershed systems, from the crest of the hills right down to the mouth of the rivers, is the proper approach to the problem of flood control. In his opinion this will stop the never-ending race between the engineers who build the downstream levees and other retaining structures, and the slow inevitable rise of river waters.

The Secretary closed his speech by stating that we have changed from a nation of limitless free land to a nation that has to make the best of the soil it now possesses; there is no more free land. Solving the problem of keeping the soil on the land where it belongs is a job that calls for the adaptation of man's needs to Nature's processes. Water that is made to creep instead of run, not only preserves the soil but also safeguards the engineering structures that handle floods.

TOPSOIL

Pick up a handful of soil from your west cornfield; crumble it with your fingers; feel its texture. Then take a two minute walk down to the creek and do the same thing with soil from the meadow. It will be harder to get a handful of soil there; the sod holds tight to the ground as if it were an old friend and before you can get a handful of soil you have to scrape the accumulation from innumerable, tiny, threadlike rootlets. If you roll it around in your hand and tamp it between your fingers, the chances are that the meadow soil has a rich loamy feel. Maybe the texture is different from the cornfield soil. At any rate your sense of touch tells you there is a difference between the soils of the two fields, especially if the cornfield is located on a steep slope with the rows running up and down hill.

It is also possible to show that the topsoil, even within the boundaries of your own farm, can be different in its type, in its depth, and in its fertility or humus content. The fact that the fertility varies because of differences in the use of a field is obvious--some crops take from the soil; others contribute to it. But the fertility of the soil is also determined by the extent to which erosion is present--cultivated land on steep slopes has its fertility lowered by the leaching effect of rains. The depth of the topsoil in any field is also affected by the degree of erosion that exists over that field--severe erosion on a steep slope sometimes strips away all of the topsoil which might have been as much as 8 to 14 inches deep before it felt the bite of the plow and was uncovered to the wash of the rains.

Since the soil types and conditions on each farm generally vary, the methods of erosion-control that can be applied also vary. To determine

this difference, the Soil Conservation Service has a land survey department which studies the soil type, slope, degree of erosion, and present cropping system in effect on the individual farm. Knowledge of these factors is vitally necessary in establishing any coordinated program of erosion-control.

In Pennsylvania, for instance, some of the soil types do not lend themselves to terracing because of the topsoil's comparative shallowness on slopes where terraces would otherwise be advisable. It is evident from this one example that the land survey department's tabulations of soil types and slopes can help engineering, agronomy and forestry in determining the erosion-control measures that can and should be used, as well as the most effective ways in which they can be applied. In the same way the determination of the degree of erosion present and the cropping system in use on a farm are other bases on which the departments of the Service build their recommendations for erosion-control on the farm.

With this in mind, the next time you see a land survey man going over your neighbor's field with a level and a test kit, or a soil auger, you might do well to have him explain the interesting story that hides behind the simple tools he carries, and the use he makes of them.

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The annual losses due to soil erosion in the Mississippi River watershed are at least twenty times greater than the flood losses caused by the Mississippi River and its tributaries.

WOODLAND IMPROVEMENT DEMONSTRATIONS

According to reports covering the Woodland Improvement Demonstration meetings in Pennsylvania, the fastest time recorded in the two-man log sawing contests has been 30 seconds. This time is based on the use of a 15-inch oak log, and an ordinary pocket watch, so there may possibly be some slight discrepancies. As further reports come in from the Woodland Improvement Department, this figure may be revised.

To date there have been ten Woodland Improvement demonstration meetings in Pennsylvania sponsored by the Soil Conservation Service, in cooperation with the Agricultural Extension Service. The purpose of these meetings has been to assemble a group of interested farmers on a farm where woodland improvement work has been done, so they might make a tour of the work and see how proper care of woodlands fits into a complete program of erosion-control.

C.C.C. boys, directed by Soil Conservation Service foresters, carry out the work of establishing these demonstration woodlands.

When woodlands are improperly cut, or are allowed to deteriorate from grazing practices; fire, or insect and disease infestations, the resulting forest growth is often so sparse that soil erosion begins and gradually destroys the wooded area. Since most of Pennsylvania's farm woodlands are on hill tops or on steep slopes, this erosion has a very serious effect on the open fields below which need the protection that a well-managed woodland gives them.

Another result of the destruction of woodlands is the rapid loss of soil moisture. The tree roots not only bind the soil, but in a healthy stand of timber the accumulation of leaf, limb and twig litter on the ground causes the rain and melting snow to be gradually absorbed by the soil, thus

preventing rapid or 'flash' run-off of water.

Briefly the work of the Woodland Management Division of the Soil Conservation Service in the demonstration areas of the state has included the planting of trees on eroding lands; the study of the condition of existing woodlands; the establishment of woodland demonstration areas; the planting of trees and shrubs; the construction of feeding shelters necessary to encourage wild-life, and the protection of woodlands from grazing.

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The United States Department of Agriculture has a machine called a "rain stormer" which makes rain without having to wait for natural showers. The big advantage of this lies in the fact that tests on various plots of ground which can be reached by the "rain stormer" can be finished much more quickly than by waiting for the rains. The amount of rainfall from this machine can also be regulated to any volume or intensity.

* *

There is a place on this earth where seven cities have been uncovered, lying one on top of the other. They were separated by beds of silt which were formerly the agricultural lands which brought the cities their trade and gave them their growth.

MR. BARNER SPEAKS

Down the valley between Liverpool and Millerstown, Pa., lives a farmer, Charles Barner by name, who decided to do something about soil washing in his fields some twenty years ago. As a result, when the traveler on the valley road rounds a sharp curve about four miles from Liverpool, the Barner farm stretches out before the eye in five, long strips across a long level slope. The strips are about 120 paces wide. It is a striking sight to behold, but more important than that, it is Mr. Barner's answer to soil washing. The five strips are on a slope that gradually rises from a gentle three percent down near the road, to a steeper ten percent near the top of the hill at the farm boundary. Mr. Barner says that he used to plow his furrows straight up and down hill, but that he soon found that a lot of the soil on the ten percent slope took that opportunity to move down to the three percent part of the field. All in all, that might have seemed a fair exchange- better crops below, poorer crops above. But Mr. Barner discovered that the richer soil below was not returning enough extra in the way of crop yields to make up for the loss on the upper part of the field. His answer to the problem was to place strips across the face of the slope.

That strip cropping met his problem of washing and did it well is shown by the fact that a number of his neighbors down the valley have gradually been adopting his system. Perhaps the change would have come about quicker but Mr. Barner says, "It takes a little while to get used to working along the side of the hill after a man's been going up and down for a long time". Mr. Barner says that the little trouble caused him by having to get used to working the strips was more than repaid by seeing that the soil "stayed put".

THREE GENERATIONS OF STRIP CROPPING

Heavy rains don't bother the Leisey farm nor the Leisey men any more. Almost twenty years ago they found that their fields were acting like the hair on a bald man's head - a little shy at the top, and thinning out further down. They found that the meadow down near the creek was gradually concentrating all the topsoil wealth of their fields within its boundaries.

The Leisey farm is about a mile out of the town of Pine Grove, Pa. and only a few miles from Pottsville. Today, as a result of the decision to do something about soil washing, there are three generations of the Leisey family farming in strips across the level of the long slope which comprises their land. We came across the grandson the other day, finishing up some spring planting on one of the strips. Up and down the hill the strips were alternated; one for close-growing crops, then one for cultivated crops that erode easily. The grandson said that they rotated the strips each year so that the erosive crops generally were protected on either side by close-growing crops.

When we went back to the house to talk to the grandfather, we found that the Leiseys had gradually been cutting down the width of their strips over a period of years. They had discovered that small gullies sometimes started in the lower part of strips of erosive crops, if the strips were too wide. At first these small gullies were left in grass to stop their growth, but that cut down the area and interfeered with cultivation. Consequently the Leiseys decided to narrow the strips.

The grandfather says that cropping the long slope of their lands in these narrow strips has solved the problem of soils washing on their farm, and that their soil now stays where it belongs - feeding the crops instead of filling up the creek.

WILD-LIFE AND EROSION-CONTROL

Certain phases of wild-life conservation are very closely tied up with erosion-control. For this reason the four demonstration projects of the Soil Conservation Service in Pennsylvania include wild-life conservation as part of the program which they are advocating.

It is frequently noted that a widespread reduction in the bird population over a given area has resulted in a corresponding increase in the damage suffered from insect pests. One result of the consequent destruction of crops is a lessening of the vegetative cover of the land and an increase in erosion. Sick crops - sparse crops - do not hold soil in place.

Very likely the gradual increase of insect pests noted in Pennsylvania over a long period of years could be largely explained by pointing out that a lack of proper environment has cut down the bird population. When a farmer clean-tills or pastures the majority of his land and cuts down the amount of "edge" or woodland margin, he is destroying wild-life food and shelter. Consequently he is reducing the number of birds.

A major part of the wild-life program consists of restoring this environment. It is a simple matter to leave wild-life lanes or "edge" in woodlands that figure in an erosion-control program. It is equally simple to plant shrubs that carry berries attractive to bird appetites. They can be placed along fence rows, in corners or on odd bits of unused land on the farm. Planted this way they perform a dual purpose; their roots hold the soil from washing, especially along fence rows where washing is often evident, and their fruit provides food for a larger wild-life population which directly benefits the farmer.

Obviously there are still other objectives in a wild-life conservation program, and there are other advantages that will follow the establishment of such a program. However, considering the place of wild-life

in the program of the Soil Conservation Service, the establishment of proper environment for birds ties in most closely with erosion-control because of the type of plantings recommended and also because of the probable consequent reductions of insect damage.

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SOIL CONSERVATION IN THE EIGHTEENTH CENTURY

The Reverend Jeremy Bellnap, A.M., of New Hampshire, evidently preached good agriculture and soil conservation nearly a century ago. His History of New Hampshire says:

> "Many of you, I presume, have yet to learn that a great part of the nutriment of vegetable suhstances is derived from the air, and that the soil itself is enriched by that means."
>
> "When you lay down your worn out lands, if you sow them with clover or other grasses, they will be the sooner recruited, than if you leave them to bear only weeds, which may accidentally spring up; and if you plow in the green crop, you will promote their fertility, in a much greater degree."

This quotation embodies crop rotation, the use of legumes, and the restoration of organic matter to the soil by the plowing under of green manure--all of these are practices recommended in a broad program of soil conservation.

Southeastern Pennsylvania and some parts of New England were among the first localities to work out and adopt a regular system of crop rotation even before the Revolutionary War.

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SEEIN' IS BELIEVIN'

"I'm from Missouri!" says a skeptical voice. We all know what that means when we hear it.

A Chinese proverb points out that a picture is worth ten thousand words. It is easier to believe that something is happening a hundred miles away if we can see a photograph or a moving picture of what is going on, than if we merely read about it.

Even the man who goes deep-sea fishing carries a picture of his catch as a sort of "convincer" for the doubting folks back home.

Because the work of the Soil Conservation Service is still young, and because people in general are just beginning to appreciate the real necessity for erosion control, photography plays a varied part in helping along the work of the Service.

First, and most important, it is a way, a very good way, of finding out how effective measures of erosion-control have proven under varying conditions. A photograph is also a visual lesson. The farmer in one county can see the latest measure of erosion control practiced by his neighbor in the next county - and he doesn't have to take a trip to do it.

"Seein' is believin'" we said. In order that people- both farm people and city people- may understand erosion and its problems, they have to see it. For instance, a picture of a fallow field before a heavy rain and a picture of the same field after a heavy rain, placed side by side, tell a story far more vivid than a whole row of crop yield figures.

A baby learns to see first; then to talk; then to write. No wonder "seein' is believin'". Why shouldn't the old Chinese proverb be right?